

(j) The cargo pumping/piping systems must be arranged independently from all other systems. Cargo transfer pumps and piping (including fill, discharge, vent, and sounding piping) must not be located in or pass through any accommodation, service, or machinery spaces.

**§ 111.106-5 Cable and wiring.**

(a) Cable and wiring in hazardous locations must meet the cable construction and testing provisions of IEEE 1580; UL 1309; MIL-DTL-24640C; MIL-DTL-24643C; or IEC 60092-350:2008 and IEC 60092-353:2011 (incorporated by reference, see § 110.10-1), including the respective flammability tests contained therein, and must be of a copper-stranded type.

(b) Type MC cables, when used, must meet the requirements in § 111.60-23 of this part.

(c) For intrinsically safe systems under the standards cited in § 111.106-3(b)(1) and (b)(2) of this subpart, the wiring methods must meet Section 504.30 of NFPA 70 (incorporated by reference, see § 110.10-1). For intrinsically safe systems under the standards cited in § 111.106-3(b)(3) of this subpart, the installation and wiring must meet Clause 7, except for Clause 7.3.1, of IEC 60092-502 (incorporated by reference, see § 110.10-1).

**§ 111.106-7 Classification of adjacent spaces with access to hazardous locations.**

(a) Hazardous location classification of adjacent spaces must comply with Clause 12.5 of either API RP 500 or API RP 505 (incorporated by reference, see § 110.10-1).

(b) A differential pressure-monitoring device or a flow-monitoring device, or both, must be provided for monitoring the pressurization of spaces having an opening into a more hazardous zone. A running fan motor or a fan-rotation monitoring device indicator is insufficient to satisfy this requirement.

(c) During initial startup, or after shutdown of the pressurization or ventilation system, and regardless of the classification of the hazardous location, the space must be ventilated or purged, followed by pressurization or

ventilation of the space, before any electrical apparatus within the space may be energized. The atmosphere is considered non-hazardous when the concentration of explosive gases or vapors is below 30 percent of the lower explosive limit at all points in the space, equipment enclosures and vent ducts.

(d) Only electrical equipment and devices that are necessary for the operational purposes of the space may be installed in spaces made non-hazardous by the methods allowed in this section.

**§ 111.106-9 Classification of flammable or combustible cargo storage and handling locations.**

(a) This section applies to locations surrounding the storage and handling locations of flammable and combustible liquid cargoes with closed-cup flashpoints not exceeding 60 °C (140 °F).

(b) The following are Class I Special Division 1 (Zone 0) locations:

(1) Enclosed areas containing devices handling cargoes, such as cargo handling or pump rooms, except as modified by § 111.106-13 of this subpart.

(2) The interiors of cargo storage tanks, slop tanks, any pressure-relief pipework or other venting systems for cargo and slop tanks, pipes and equipment containing the cargo or developing flammable gases or vapors.

(3) Areas on an open deck, or a semi-enclosed space on an open deck, within 0.5 meters of any cargo storage tank outlet, cargo gas or vapor outlet, ullage opening, sounding pipe, cargo tank opening for pressure release, or cargo storage tank pressure or vacuum valve provided to permit the flow of small volumes of gas or vapor mixtures caused by thermal variation.

(4) Areas on an open deck, or semi-enclosed spaces on open deck, within 0.5 meters of any cargo handling or pump room entrance, or cargo ventilation handling or pump room ventilation inlet or outlet.

(5) Areas in the vicinity of any cargo vent outlet for free flow of large volumes of vapor mixtures during cargo loading and discharging of storage tanks, within a vertical cylinder of unlimited height, of 1 meter radius centered upon the vent outlet, and within a hemisphere of 1-meter radius below the vent outlet.